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ABSTRACT

The relationship between speech and print is essentially asymmetrical and changes as the reading ability of the child improves. For the child who has succeeded at decoding, the asymmetry implies that commonalities between speech and print are more important than their differences. Three hypothetical observation points illustrate the similarity between speech and print: (1) beginning reading--speech has many unique properties, the speech-print overlap is small, and print is more similar to speech than speech is to print; (2) intermediate reading--print has more properties than at point one (both unique and shared with speech), print has become more similar to speech and speech has become more similar to print, and print is more similar to speech than speech is to print--however the asymmetry is much less than at point one; and (3) adult skilled reading--print experience has further increased both print's unique properties and those shared with speech, speech has relatively fewer unique properties than before, and speech is nearly as similar to print as print is to speech. For the child, the first two observation points are the important ones. The first point affords the view that the beginning reader confronts a task that has several differences from what the reader is accustomed to--that reading requires decoding and that reading is out of context. At the second point, the third grade child, if decoding has been mastered, is very dependent on listening ability. (HOD)

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Language, Speech and Print

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The starting point for considering the relationship between the comprehension of spoken and written language is to acknowledge that there are both important commonalities and significant differences between the two. Polemical discussions have tended to dwell on either the commonalities or the differences to the exclusion of the other. These discussions sometimes include extreme viewpoints that amount to slogans. One extreme is represented by the claim that "Writing is speech on paper" or "Print is speech writ down" or "Reading is listening plus decoding." Let's call this the commonality view. The opposite extreme is represented by the claim that spoken and written language are independent and have nothing in common except that they both are symbol systems mapping language forms and meanings. Let's call this the distinctiveness view.

These matters are, of course, quite important for the teaching of reading. If the commonality view is more nearly correct, then one might imagine that teachers of reading should teach children how to convert print to speech and everything else would take care of itself. Or, at least, the child's reading level would reach his listening level. The distinctiveness point of view implies that teaching a child how to convert print to speech will not only fall well short of teaching him how to read but will actually mislead him concerning the nature of reading. By this view, the child must learn the special characteristic

demands of reading or reading will not reach a level approaching speech comprehension.

No one ought to take either of these extreme views seriously. Print reading is more than understanding speech writ down. And reading is less than an independent symbol system contrived to serve special purposes. What I will argue is that, once the extreme positions are recognized as mere slogans, the theoretical and practical relationships among language, speech, and print become interesting. In particular; (1) the relationship between speech and print is essentially asymmetrical in some important ways; (2) this asymmetry changes as a child improves his reading ability; (3) for the child who has succeeded at decoding, the asymmetry implies that commonalities between speech and print are more important than their differences. In what follows I will deal with each of these three points.

The Asymmetry between Speech and Print

The source of the asymmetry between speech and print is this: For the child learning to read, print is more similar to speech than speech is to print. This may seem a perverse logic. After all, if A is similar to B, then B is similar to A.

However, psychological similarity does not necessarily follow this particular paradigm of symmetrical logic. Tversky (1977) has shown that the similarity relation between two things depends on their relative salience. For the purpose of this discussion, my claim is that print is more similar to speech because speech is psychologically primary. Speech is less similar to print because print is psychologically secondary, at least for children.

The general point that psychological similarity can be asymmetrical is best illustrated for cases other than reading. Suppose you are asked to rate the similarity of two countries, as shown in the first illustration.

In one case you are asked to judge, on a scale of 1 to 7, how similar is East Germany to the Soviet Union. Judgments will vary with individuals, but most will judge similarity to be between 4 and 7, with an average of, say, 6. Now let's reverse the terms. Indicate how similar the Soviet Union is to East Germany. The average rating in this case is lower. Americans, on the average, do not think of the Soviet Union as similar to East Germany to the extent that they think of East Germany as similar to the Soviet Union.

In case you are tempted to dismiss this as some quirk connected with Soviet political dominance over Eastern European satellite countries, consider the remaining judgments of illustration 1.

How similar is Alaska to Canada?

How similar is Canada to Alaska? For most Americans who are not Alaskans, Alaska is more similar to Canada than Canada is to Alaska.

To make sure that asymmetries are not restricted to judgments about countries, judge the following pair:

How similar is a space shuttle to an airplane?

How similar is an airplane to a space shuttle? Most people will judge more similarity between a space shuttle and an airplane than between an airplane and a space shuttle.

What does this all have to do with speech and print? The examples given fit Tversky's (1977) theory of similarity and I suggest that print and speech do also. In particular, for children learning to read, print is more similar to speech than speech is to print. For experts in reading the similarity between print and speech is more nearly equal. For some people (hyper-literates), speech actually may become more similar to print than vice versa.

The principle in all these cases, countries, airplanes, and language modalities, is that the less salient or less familiar is more similar to the more salient or more familiar than vice versa. East Germany is more similar to the Soviet Union if you are more familiar with the Soviet Union. However, if you are an East German expert, the asymmetry does not exist or, indeed, it could exist in the other direction. Likewise, for most people, a space shuttle is more similar to an airplane than vice versa only if an airplane is more familiar. And reading is more similar to speech than vice versa only if speech is more familiar to you. For a child beginning school, there is no doubt about the familiarity difference. Reading, not speech, is unfamiliar.

While the examples so far have been for judgments of similarity, I suggest that processing similarity follows this asymmetry principle. Processing in a less familiar domain is more like processing in a more familiar domain than vice-versa. For speech and print, the key to this suggestion is the experience the child has had with the two language forms. This is shown in Figure 1, which shows three hypothetical

observation points throughout a child's life. At point 1, he has considerable experience with speech and negligible experience with print, because he is just learning to read. By observation point 2, he has been at reading for 3 or 4 years, and the similarity gap between reading and listening has closed. The two share more attributes and reading is still more like listening than vice versa. Observation point 3 represents a still later point after more reading experience. This may not be a typical child but a typical college student. The overlap between reading and listening is still larger. Furthermore listening is nearly as much like reading as reading is like listening.

Given this general picture, I turn now to some of the ways print and speech differ, how this matters for reading, and how it changes with the child's development of reading skill.

How Early Reading is Different from Speech

There are many apparent differences between speech and reading. Think of a brief list: Speech has prosody to help signal meaning, print does not; print relieves memory demands; speech makes memory demands; print imposes decoding demands; speech does not; speech requires social contact; reading is an individual activity; the choice of speech content is seldom arbitrary; print content often is arbitrary, at least from the perspective of the child reader; print marks word boundaries unequivocally with spaces; speech does not always mark word boundaries with silence.

This list could go on as we think about finer and finer distinctions. We can consider the implications of these differences for differences in ease of language processing. If we keep score, we are likely to decide that most differences favor speech, with two exceptions: reading makes memory less obvious because the words are there for reinspection, and reading makes words easier to identify because they are consistently marked by spaces. All other differences will seem to favor speech, through one of three general factors; decoding, communication context, and motivation. The first two directly affect how language is processed and the last indirectly affects it.

The contextual differences and the coding differences are worth trying to understand because (1) they are critical in processing; and (2) they reduce and perhaps disappear with increased familiarity with print.

The coding factor. There is so much to say about decoding, and so much of it has been said, that the only point required here is to emphasize its importance. The fact that print is constructed as a code on speech is a critical element of reading. It does no good to pretend that decoding is an obstacle to the child's enjoyment of reading, created by the phonics lovers or scribes or psychologists. Unless someone helps the child discover relations between print symbols and speech sounds, the child risks not discovering something very important to become an independent skilled reader. Young children who have difficulty in reading almost invariably have imperfect knowledge of the symbol-speech code.

I turn now to the second critical difference, the fact that reading is decontextualized.

The contextual factor. The basic point here is that reading is decontextualized while speech is heavily contextualized. There are a number of things entailed by this contextual difference, but the most important have to do with contextual support. At the time a child enters school, his uses of language are almost entirely restricted to speech events that take place in very rich contexts. When a child hears his mother say "Close the refrigerator" there is an open refrigerator to see and there is a human speech agent whose general appearance supports the speech act she has just made. In other contexts, there are comparable contextual supports. For example, speech heard on television tends to be embedded in rich social and narrative contexts. And speech interactions with a child's peers occur in rich purposeful play contexts. In general, the child hears about the here and now and he can often see what's being referred to in the speech as well as why someone is saying what they are saying. Even when he confronts speech that refers to things remote in time or space he has contextual cues to support the speech and he often has a speaker who is willing to rephrase the question should it misfire.

Print is different. It's not that it doesn't use context to support its messages. (Children's books are full of pictures.) The problem is that most of the support is part of the printed page, except for what the teacher can provide externally, and it has always a strictly secondary role.

To put it another way, in reading the printed sentence contains intrinsic meaning. The meaning is formalizable as propositions, formal abstractions of meaning. For speech, it's not even clear that propositions exist as formal objects. The spoken sentences contain propositions, but their rich context makes treating them as propositions unnecessary and perhaps even unlikely.

David Olson (1977) has made the argument that linguistic meaning, as defined by propositions contained in sentences, is a unique attribute of literacy. I think there is considerable merit to Olson's argument. Linguistic meaning, in a sense, does not exist in preliterate speech. For a culture, it exists only when an evolution toward written symbols confronts people with decontentualized symbolic content, permanently available for analysis and reflection. For a child, it exists only when he confronts pages that contain meaning only in the properties of the printed sentences. It is interesting, incidentally, that, by this line of reasoning, the sort of semantic and syntactic analyses that linguistics offers is possible only through print (this is an especially ironic perspective on a science which has traditionally emphasized that speech is primary).

The suggestion that the contextual difference between speech and print are profound may seem to be an exaggeration. However, the grain of truth in an argument can sometimes best be appreciated by examining cases which exemplify its extreme positions. One of the most abstract and incomprehensible texts in English that I have ever encountered is a book called The Death-Life Law of Nature. A sample page from this text is shown in Figure 3.

Figure 3 shown here

The sentences are all well formed and well connected. However, some property of the text makes it difficult. The conscientious reader is tempted to read a sentence and then to reread it. Comprehension is possible but it doesn't seem to be the same kind of comprehension that we experience in a contextualized speech event such as "Close the refrigerator." My general point here is that it's hard to imagine such texts being produced except by writing or by hyperliterate speech. Of course the very words in this text are abstract and this is a large part of the problem. A text encountered by a child obviously will not contain such abstractions. But it will contain sentences without the kind of context that supports speech understanding.

Before concluding this section, it is useful to connect this argument with observations about the child's linguistic competence at the age of six. Research on what the child knows about syntax prior to the school years is not consistent with the earlier view of a fully competent linguistic being. The idea that the 4 year old child had developed all the basics of syntax and had only to be filled in on certain idiosyncratic details no longer seems valid. Instead, it may be more accurate to characterize the young child's knowledge of syntax as very context dependent. For example, the 5 year old child does not really seem to understand passive sentences with two nouns when either noun pragmatically could be the agent. For example, the child will appear to understand the sentence The meat was eaten by the dog. However his "understanding" is strictly based on pragmatic knowledge about eating. He will often fail to understand a sentence such as The car was hit by the truck. While the form of the car-truck sentence is

the same as the meat-dog sentence, pragmatic knowledge is not helpful because the child knows either a car or a truck could have done the hitting. The point is that while the child appears to have control over a linguistic form, he may in fact be very dependent on context. Similarly, while 3 year old children understand the difference before and after in context, it's not clear that they can do so when only the linguistic forms govern the interpretation of temporal order. Ordinarily contextual cues to temporal order are sufficient. When they ae not, the child has difficulty.

It's not so much that the pre-school child's linguistic knowledge is not considerable, it's that some of what he knows about form is rather tentative. He can demonstrate competence in one situation but not another. This is quite consistent with the picture of a child who has had the luxury of almost totally contextualized speech encounters. His reading experiences will confront him with decontextualized messages and provide him the opportunity to master linguistic forms that are only partially mastered before then. This is one of the ways I think speech comes eventually to be more like print. But at the beginning, the dependence on form for meaning is a distinctive feature of reading.

How Later Reading Becomes More Like Speech

A later observation of the relationship between speech and print, shows a different picture. As reading is acquired it becomes more speech like. In terms of the two factors that I've considered, coding and context, this is mainly due to the mastery of coding. As the child comes to first acquire the general requirement of decoding and then the more refined efficiency of it, reading becomes increasingly like

listening. I think the two phases to decoding mastery are important - first accuracy and then efficiency, to put it crudely. There is of course very consistent evidence linking decoding accuracy and decoding speed to reading comprehension skill. The accuracy link is elementary. Comprehension depends on accurate word recognition. The efficiency argument, which has been made in different forms by LaBerge and Samuels (1974) and by me and my colleagues (e.g., Perfetti & Lesgold, 1979) is also very reasonable: processes of comprehension are easy to the extent that processes of word recognition do not occupy limited capacity processing mechanisms. Fast and automatic is better than slow and effortful.

The link this has with the present argument is that accuracy at decoding will be the first print component that can prevent reading from becoming like listening. The next component will be the effort of decoding. When these components have been mastered, then reading is potentially as easy as listening. Equivalently, a child's reading level can reach his listening level (Sticht, 1979).

To this point, I have avoided citing data in connection with my main argument. There are data, however, relevant for this particular point that are worth citing. We have much data by Thomas Sticht on the relationship between listening skills and reading skills. They support the assumption that the two are closely related. Moreover, by the present argument their relationship ought to become closer as the child becomes better at reading. In a recent paper Curtis (1980) has provided evidence consistent with this expectation. Curtis (1980) compared second, third and fifth graders of high and low skill on a number of tasks. To oversimplify, the results of interest in this context were

that listening comprehension accounted for more unique variance in the reading comprehension of fifth graders than it did in that of second and third graders. For the younger subjects, a general factor that included both decoding and listening comprehension was most important. Similarly, less skilled subjects showed a general factor that included decoding and listening more than did skilled subjects of the same age. Thus, the general pattern is that as a child gets older and more skilled in reading, his reading comprehension looks more like his listening comprehension. However, decoding is not much of a factor unless he has not become good at reading.

A number of studies done by me and my students have been consistent with the picture that poor readers, as measured by a comprehension test, are also poor at listening comprehension. One of the most convincing of these studies was by N. Berger (Berger & Perfetti, 1977) who found that IQ matched fifth graders low skill readers differed as much in recall and recognition of simple stories when the stories were spoken as when they were read. Similarly, we have found that memory for words spoken in a story, when measured seconds after hearing them, is just as poor for low skill readers as when the text is read. These conclusions seem to hold especially well for older children, say 4th and 5th grade and beyond. The younger the child, the less they hold because decoding is a big factor.

Even for very young children, it is becoming increasingly likely that we must see their reading failures as intimately related to failures in speech processing (e.g., Byrne & Shea, 1979; Liberman & Shankweiler, 1979). Such children may have <u>decoding</u> problems that are dependent as failures of speech processing, including lack of explicit

knowledge about speech and failures to encode speech sounds. Children who have difficulty only with decoding will do well when decoding finally is mastered, but to the extent that speech processing problems are pervasive they will have to be overcome. It's an interesting possibility that mastering decoding will help this.

How Later Speech Can Become More Like Print

The second factor separating early reading from speech also changes so as to bring the two closer together. However, we are really at a loss for evidence concerning the contextual factor. What I suggest is that the child in the elementary years begins to notice a lot of things about language as a result of his successful encounters with print. (Incidentally, I think that if his encounters with print are unsuccessful, this will not occur.) Part of this is noticing things about word boundaries and word constituents. For example, most investigators now believe that knowledge of speech segments is promoted by learning to read (Ehri, 1981; Liberman et al, 1977; Perfetti, Beck, & Hughes, Note 1). More to the point, through reading the child may really come to appreciate the truly expressive power of language. He may learn that sentences contain meaning without reference to anything else. Certainly by the time he learns to solve abstract problems of language, including algebra as well as natural language syntax, he has learned to deal with intrinsic meaning. But we have little research that would help fill in this picture.

One implication of this argument is that eventually speech will become more like print in its ability to express intrinsic meaning. For example, listen to this speech. I suggest you find it no easier nor no harder to comprehend than when you read it. But you were willing to try. It was not in principle any harder just because it was spoken. That's because as literate adults, perhaps hyperliterate, we have become able to handle decontextualized messages in either speech or print. The very fact that we can listen to a talk that was written down is evidence for this. My writing of this talk is a bit different from what it would be had it been written for publication instead. But the differences are trivial. The language is no less abstract and the meaning is not particularly contextualized. I implicitly assume that intrinsic decontextualized meanings, while never as easy to process as extrinsic contextualized meanings, are not handicapped by a speech mode relative to a point mode. We would not make such an assumption for a third grade child without some risk.

To return to my earlier perspective: A hyperliterate adult is one for whom speech has become more like reading than reading is like speech. He is no longer more experienced in speech than in print. His processing of speech may be more similar to his processing of print than vice versa.

This, of course, is not the person we are worried about in the teaching of reading. For the child, the first two observation points are the important ones. Observation point 1 affords the view that the beginning reader confronts a task that has several differences from what he is accustomed to, and at least two of these are especially important. That reading requires decoding is the first one and it partly masks the

second difference, that reading is decontextualized. At observation point 2, the third grade child, if he has mastered decoding, is very dependent on his abilities at listening. If he can be pushed beyond these abilities he will be better at speech as well as print. He will use print to learn more about linguistic forms and how to extract messages from them no matter how unfamiliar the context. For him reading is more like speech than speech is like reading but he is in a position to begin to reverse the situation.

Reference Note

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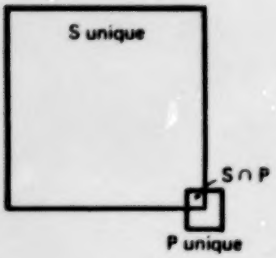
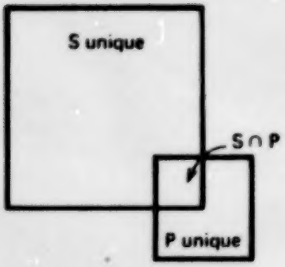
THE SIMILARITY BETWEEN SPEECH AND PRINT OVER FOUR HYPOTHETICAL OBSERVATION POINTS



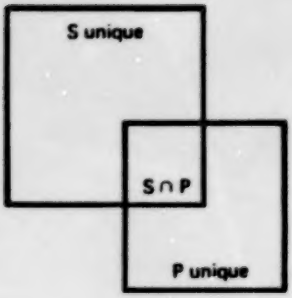
1. BEGINNING READING

- Speech has many unique properties;
- Speech-print overlap (S∩P) is small
- Print is more similar to speech than speech is to print



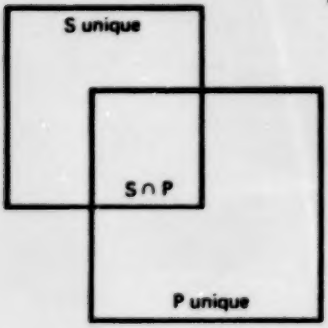
2. INTERMEDIATE READING

- Print has more properties than at 1, both unique and shared with speech
- Print has become more similar to speech and speech has become more similar to print
- Print is more similar to speech than speech is to print; however asymmetry much less than at 1



3. ADULT SKILLED READING

- Print experience has further increased both print's unique properties and those shared with speech.
- Speech has relatively fewer unique properties than before.
- Speech is nearly as similar to print as print is to speech.



4. HYPERLITERACY

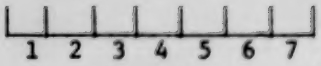
- Print experience has exceeded speech experience
- Speech experiences have become more like print
- Speech is slightly more similar to print than print is to speech; reversal of asymmetry

An Excerpt from

The Death-Life Law of Nature

by R. W. Maxwell

There are a great variety of "throw away" artifacts which facilitate increased IN-ON reversion by quickly replaceable OUT 1-OUT 2 reversion. The senses five enjoy the role of matching the reversion rate of inherited IN-ON by the reversion rate of OUT 1-OUT 2 in real symbols until confronted with the improbabilities of insatiable mismatches of blinding impulse velocities. The interesting thing is that the senses five are the OUT 1 of this equation which repeatedly complements IN mutation of the ON with OUT 1 replacement of OUT 2. The faster the IN-OUT revert, the faster the senses five rush to replace OUT 2 for temporary death-life match. Thus with proportional excessive velocities of the IN-ON reversions, the compelled senses five may insatiably revert the OUT 2. This can be pictured as an exchange and throw away of paper garments as fast as the senses can so perform until the senses revert to the hallucination of exhausted dream sleep, coma, or overt frenzies. For the senses five also revert from frantic life excesses to the hallucinations of death excesses for natural balance to the organism. This felicific death-life, life-death reversion accommodates the welfare of the organism.

Not at all similar  Very similar

1. a) How similar is East Germany to the Soviet Union?

   b) How similar is the Soviet Union to East Germany?

2. a) How similar is Alaska to Canada?

   b) How similar is Canada to Alaska?

3. a) How similar is a space shuttle to an airplane?

   b) How similar is an airplane to a space shuttle?

4. a) How similar is German to English?

   b) How similar is English to German?

5. a) How similar is print (reading) to speech (listening)?

   b) How similar is speech (listening) to print (reading)?